Draft
Site-Specific Unexploded Ordnance Safety Plan Attachment
Training Area T-5, Parcels 180(7), 182(7), 511(7), 512(7), 513(7), 514(7), and 516(7)
Fort McClellan, Calhoun County, Alabama

Prepared for:

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Site-Specific Unexploded Ordnance Safety Plan Attachment Training Area T-5, Parcels 180(7), 182(7), 511(7), 512(7), 513(7), 514(7), and 516(7)

I have read and approve this site-specific unexploded ordnance (UXO) safety plan attachment for Training Area T-5, Parcels 180(7), 182(7), 511(7), 512(7), 513(7), 514(7), and 516(7) at Fort McClellan, Alabama, with respect to project hazards, regulatory requirements, and IT Corporation UXO procedures.

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26 Sep 02
Date

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THE AMERICAN BOARD OF INDUSTRIAL HYGIENE INCORPORATED
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9/30/02
Date

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List of Acronyms

See Attachment 1, List of Abbreviations and Acronyms, of the Site-Specific Field Sampling Plan Attachment contained in this binder.

1.0 Introduction

This document defines anomaly avoidance procedures for activities to be performed by IT Corporation (IT) unexploded ordnance (UXO) personnel in conjunction with the remedial investigation (RI) at Training Area T-5, Parcels 180(7), 182(7), 511(7), 512(7), 513(7), 514(7), and 516(7), at Fort McClellan (FTMC), Calhoun County, Alabama. This document is not a stand-alone document; it must be used in conjunction with the *Fort McClellan Unexploded Ordnance Supplementary Procedures* (IT, 2001), attached as Attachment 1.

IT UXO personnel will perform visual surveys, assisted by hand-held magnetometers and metal detectors, to support the collection of surface soil, subsurface soil, groundwater, surface water, sediment samples and/or other types of samples for chemical analysis at the Training Area T-5, Parcels 180(7), 182(7), 511(7), 512(7), 513(7), 514(7), and 516(7). The purpose is to avoid any ordnance and explosives (OE) during hazardous, toxic and radioactive waste (HTRW) sampling activities. Intrusive anomaly investigation is not authorized for this site work.

Training Area T-5 Sites are the following:

- Former Detection and Identification Area, Parcel 180(7)
- Training Area T-5, Parcel 182(7)
- Blacktop Training Area, Parcel 511(7)
- Fenced Yard in Blacktop Area, Parcel 512(7)
- Dog Training Area, Parcel 513(7)
- Old Burn Pit, Parcel 514(7)
- Dog Kennel Area, Parcel 516(7).

Former Detection and Identification Area, Parcel 180(7). The Former Detection and Identification Area, Parcel 180(7), is located southwest of Building 3185 and covers an area of approximately one-half acre on the west side of Rucker Street (formerly 13th Avenue). This area was used from some time in the 1950s until 1973 for training in the detection and identification of chemical warfare material (CWM). CWM used at this location may include simulants, distilled mustard (HD), Sarin (GB), carbonyl chloride (CG), cyanogen chloride (CK), dichloroformoxime, hydrogen cyanide (AC), and the decontaminants supertropical bleach (STB) and Decontamination Solution Number 2 (DS2) (Environmental Science and Engineering, Inc. [ESE], 1998). It is also believed that the U.S. Navy used the site in the late 1950s for the detection of HD (Parsons Engineering Science, Inc. [Parsons], 2002). Parsons lists the agent simulants, CK, CG, phosgene oxime (CX), and AC as possibly being used in training exercises (Parsons, 2002). Portions of this area are currently fenced and posted (Weston, 1990).

Weston reported that several types of live CWM may have been used here and that STB and DS2 were used on surface soils, presumably during final decontamination before the U.S. Army Chemical School transferred from FTMC to the Aberdeen Proving Ground, Edgewood Area, in 1973 (Weston, 1990). At some time before 1973, a pit was dug on the site and all training aids (i.e., structures) from the site, as well as a building from Area T-4, were burned twice and buried (Parsons, 2002). This pit still retained the contents of that burial and was reportedly marked for location with a marker (Stake F). Based on a notation on a site map in the Installation Assessment Records, a location in the northern portion of the site was used for GB demonstration on goats (Parsons, 2002).

Personnel interviewed during the environmental baseline survey (EBS) site visit who had participated directly in operations at this site report that no training materials (i.e., CWM) contacted the ground and that no disposal activities occurred at this location, to the best of their knowledge (ESE, 1998). Accounts of personnel interviewed during the EBS site visit differ regarding the CWM used. Some sources indicate that only simulants were used at this location, while others recall that dilute CWM-containing mixtures were used to train troops. Vials of simulated CWM (dilute live CWM, according to some sources) were reportedly placed into containers atop poles in the training area. The poles were approximately three feet tall, approximately 24 in number, and are visible on 1964 aerial photos. Simulant Chemical Agent Identification Training Set (SCAITS) kits were used at the Former Detection and Identification Area. Vials in old SCAITS kits of the 1950s reportedly contained a very low concentration of CWM. There were not any spills reported at this site (ESE, 1998). In 1973, the surface was declared clean by the U.S. Army Toxic and Hazardous Materials Agency and the FTMC U.S. Army Chemical School, and the area was authorized for surface use only (ESE, 1998).

FTMC personnel reported that other training activities, known as "G-shoots," were conducted at a nerve agent demonstration area in the northern portion of the fenced Former Detection and Identification Area (ESE, 1998). The chemical warfare agent (CWA) GB was used in this training. The operation involved placing one drop of GB on the nose of a goat, observing symptoms, then reviving the animal with an intramuscular atropine injection. Reportedly, there was very little chance of CWA release during this exercise, due to the small quantities on hand and controlled usage.

A site investigation (SI) completed in 1993 by Science Applications International Corporation (SAIC) included four soil samples collected from two locations at depths of about one foot and

six feet (SAIC, 1993). The two sampling locations were in the disposal pit and in the location where the materials were burned. The samples were screened for HD and GB by a U.S. Army Technical Escort Unit using the Miniature Continuous Air Monitoring System (MINICAMS) and nothing was detected above background readings. Laboratory analysis for degradation products was also negative (Parsons, 2002).

In 1994, SAIC conducted an RI at the Former Detection and Identification Area using geophysical surveys, trenching, and soil sampling (SAIC, 1995). Numerous geophysical anomalies were detected, some of which may indicate buried metallic or nonmetallic material. Four test pits were excavated, and four soil borings were drilled and sampled. Materials excavated from the test pits included construction debris (concrete and rebar). One soil sample was collected from each of the test pits. Samples were screened in the field for the presence of HD and GB and then sent to the laboratory for analysis of HD and GB breakdown products. No HD, GB, or their breakdown products were detected in any of the soil samples or in samples collected from this area previously (SAIC, 1995).

Analysis of historical aerial photographs by Parsons revealed past activity at this site and during the period for which CWM was reportedly used at this location. Most of the entire site was cleared of vegetation. There were not any disposal areas visible from the aerial photographs, and no other potential areas of concern were identified. Parsons walked the site during a February 1999 site visit. "Stake F," used to mark the location of the former burial site, was not located during the February 1999 reconnaissance. What appeared to be one of the three-foot poles used in training was located at the site. There were not any other ground disturbances or areas of concern identified at the site.

Training Area T-5, Parcel 182(7). Training Area T-5 is also known as the Former Area T-5: Former Toxic Hazards Detection and Decontamination Training Area. It is located between Sunset Hill and Howitzer Hill, south of Building 3174, at the end of Rucker Street (formerly 13th Avenue). The site covers approximately 10.5 acres. For the purposes of investigation, the Dog Kennel Area, Parcel 516(7), was separated from the Training Area T-5, Parcel 182(7), to be investigated with the Dog Training Area, Parcel 513(7). Training Area T-5 was reportedly used from 1961 to 1973. The site is posted and partially fenced (the fence is missing at the northern boundary). The operations conducted here reportedly involved detection and decontamination of CWM, including HD, VX, GB, and the biological simulants *Bacillus globigii* (BG) and *Serratia marcescens* (SM) (Parsons, 2002). The decontaminant chemicals STB and DS2 were probably also used here. Training was likely confined to small sites within a fenced, controlled area.

Personnel interviewed during the EBS site visit report that explosive ordnance disposal (EOD) personnel formerly conducted "render-safe" exercises on munitions (typically artillery shells) in this area (ESE, 1998). EOD personnel placed the munition on the ground and poured a vial of a specific live CWA over the munition. The EOD reaction team then identified the CWA, decontaminated the munition, and packed it for transport. Exercises reportedly took place no more than 50 meters off the road. Some reports maintain that training at Training Area T-5 used simulated CWM rounds only and that water was used as the decontaminant rather than STB or DS2 (ESE, 1998). Training sites were decontaminated and checked at the completion of each exercise (Parsons, 2002). Following completion of training at this site, all excavations were filled in accordance with standard operating procedures; training aids were decontaminated, burned twice, and sent to the landfill, or they were renovated and shipped to Redstone Arsenal (Parsons, 2002).

Previous reports speculated that this may be the site of a 110-gallon HD spill which reportedly occurred in 1955 (Weston, 1990). None of the personnel interviewed during the EBS site visit could recall a 110-gallon spill, nor could they imagine a scenario during which a spill of this magnitude could occur. However, the HD simulant molasses residuum was delivered in 55-gallon drums. Site soils were reportedly chemically decontaminated, excavated, and disposed of at Range J (ESE, 1998).

In 1972 and 1973 the Army collected shallow soil samples from Training Area T-5 and analyzed them for HD, GB, and VX. There were not any CWAs detected in these samples, and the area was permitted for surface use only (SAIC, 1993). Field screening and laboratory analysis of additional soil, sediment, and surface water samples collected at high-probability locations did not detect HD, GB, VX, or their degradation products (ESE, 1998).

The SI completed by SAIC in 1993 included soil samples collected from four high-probability locations at depths of about one foot and five to six feet and one surface water and sediment sample collected from a tributary to Cane Creek. The samples were screened for HD, VX and GB by a U.S. Army Technical Escort Unit using the MINICAMS and nothing was detected above background readings. Laboratory analysis for degradation products was also negative. This report concluded that, based on this sampling and the protocols for decontamination used at the time, the likelihood of CWM on the site was reduced.

Investigations conducted during the SAIC RI included field screening for CWM and CWM breakdown products and soil, surface water, and sediment sampling (SAIC, 1995). Ordnance was observed in Training Area T-5 and appeared to be the result of recent U.S. Army training using dummy rounds (ESE, 1998). The RI conducted in 1995 included four shallow soil samples, two sediment and surface water samples, and numerous shallow soils (44) screened on-site using the MINICAMS. Locations for sampling were based on historical documentation for the site, including training location sketches and photographs of training activities. Analyses were conducted for HD, VX, and degradation products with negative results. Recommendations of the SAIC RI were that no further investigation was necessary but that the site should be cleared of training ordnance prior to site release.

Blacktop Training Area, Parcel 511(7), and Fenced Yard in Blacktop Area, Parcel 512(7). The Blacktop Training Area, Parcel 511(7), is addressed with the Fenced Yard in the Blacktop Area, Parcel 512, as identified in the *Archives Search Report* (ASR) (USACE, 1999). The area is a little over three acres and is primarily an "asphalt parking lot" type area located along the east side of Reggie Avenue (formerly 12th Avenue), with viewing stands (bleachers) on both ends of the area and an inner fenced-in portion (Parsons, 2002). The fenced yard in the Blacktop Area is almost one-half acre in addition to the three acres in the Blacktop Area. The fence was removed at some unknown date, but parts of the fence posts remain.

The Blacktop Training Area was identified on the 1956 map of the Chemical Corps Training Areas and on the 1969 Chemical School Orientation Map (Parsons, 2002). Various demonstrations may have taken place here, such as decontamination training, but its exact use is unknown. The area was reportedly used for training in the use of flamethrowers, decontamination equipment, and smoke generators. The Fenced Yard, enclosed by the high fence, was believed to have been used to store agent or for toxic agent training. However, it may be a more recent structure (Parsons, 2002).

The analysis of historical aerial photographs shows that the area was cleared in the early 1940s and paved sometime after the 1954 aerial photograph was taken (Parsons, 2002). After the area was paved, very few changes occurred that are visible in the aerial photographs. The one change that did occur was that the fenced area (Fenced Yard in Blacktop Area, Parcel 512) on the western edge of the pavement first shows up in the 1982 aerial photograph (Parsons, 2002). Anomaly features seen on the photographs at the north and south ends of the paved area are bleachers, suggesting that training demonstrations took place here (Parsons, 2002).

There is not any record of sampling conducted at this site in the past. Historical documents do not indicate the use of specific CWM at this site. Decontamination training may have taken place, and it is not known if live agent was used (Parsons, 2002). The fenced area may have been used for storage or demonstrations of agent, but no documented evidence of such use was found. Training involving flame and smoke agents has also been reported for this site; however, these activities are no longer considered CWM-related (Parsons, 2002).

Dog Training Area, Parcel 513(7), and Dog Kennel Area, Parcel 516(7). The Dog Training Area, Parcel 513(7), is located at the south end of Reggie Avenue (formerly 12th Avenue) and near the Dog Kennel Area, Parcel 516(7) (Parsons, 2002). The area has been recently mowed and cleared; however, it is no longer in use (Parsons, 2002). Both areas are approximately one-acre sites.

The site was used for training dogs for the U.S. Army Military Police School, and remnants of the training obstacles were still in existence in September 1998 but have since been removed (Parsons, 2002). A large, blistered/corroded concrete pad which was surrounded by a high fence is located within the area and may have been used to store agents or to conduct toxic agent training in "Transfer Operations," since the Depot Area was across the road from this area (USACE, 1999).

An analysis of historical aerial photographs revealed that this area contained numerous buildings in the 1940s, and the concrete pad is one of many building foundations from that era. More recent aerial photos showed several cleared areas that were likely used for dog training, but there are not any suspect CWM training areas (Parsons, 2002).

A site visit by Parsons in February 1999 showed the area was cleared of former dog training aids except for the concrete pad located at the site. This pad is heavily blistered and corroded, unlike other foundation pads in the vicinity (Parsons, 2002).

The Dog Kennel Area was identified in the ASR as having a possible storage area in the inner yard that could have been used for toxic agents. The Dog Kennel Area is shown on the 1969 Chemical School Orientation Map as being a part of Training Area T-5. Mustard confidence training, which used drops of mustard, may have taken place within the Quonset hut located inside the perimeter fence (USACE, 1999). However, historical aerial photographs did not indicate the likelihood of disposal within these areas (Parsons, 2002). Small quantities of HD may have been used at this site. However, the reported use would likely have occurred within

the confines of the structure in the fenced area. Parsons found no evidence of a burial pit at the site during a site visit (Parsons, 2002).

Old Burn Pit, Parcel 514(7). The Old Burn Pit, Parcel 514(7), is located in the woods behind Motor Pool 3100 on Rucker Street (formerly 13th Avenue) and covers an area of 0.15 acres. It is across the dirt road and just to the west of the northwest corner of the Former Detection and Identification Area, Parcel 180(7). This site was identified for consideration during the field visit to collect information for the ASR (USACE, 1999). The site appeared to be a burn pit. Although nothing is known about the site and this area is not specifically listed as hosting chemical training, it was selected for further sampling to ensure that CWM was not present (Parsons, 2002).

The aerial photograph analysis conducted by Parsons does show a well defined cleared area in the 1961 aerial photograph that coincides with the location of the burn pit (Parsons, 2002). A site visit by Parsons in February 1999 revealed the area behind Motor Pool Area 3100 to be wooded, but the remains of the pit were still visible. The pit was covered over with a wire mesh and contained some remnant metallic objects within it (Parsons, 2002).

Three depressions near the Old Burn Pit were investigated intrusively by Parsons using hand tools (Parsons, 2002). Investigation of Burn Pit 1 was the primary objective of the CWM Engineering Evaluation (EE)/Cost Analysis (CA) study at this site. Pit 1 was found to contain multiple inert and practice OE items, as well as other metal debris (Parsons, 2002). Pit 2, which was noted during the CWM EE/CA investigation of Burn Pit 1, contained a steel box with cans, wire-wrapped cans, plate glass, and a dummy grenade. Pit 3, also identified during the CWM EE/CA field work, contained flakes of rust and jar lids. No evidence, such as charred wood, suggested that these pits were ever used for burning (Parsons, 2002).

OE items encountered during the intrusive investigation at the Old Burn Pit included practice rifle grenade bodies, 60 millimeter (mm) practice mortar rounds, a 81mm mortar round, a mortar tail fin, rifle grenade tail booms, and .30-caliber casings (Parsons, 2002). The OE items were vented and/or certified to be inert and were disposed of as scrap to Oxford Scrap Metal Company (Parsons, 2002). There was not any evidence of CWM found; the items recovered were all conventional ordnance-related. Metallic anomalies were still present in the sidewalls of the pits following termination of the pit investigations by Parsons (Parsons, 2002).

Parsons CWM EE/CA. In 2001 Parsons conducted an EE/CA investigation at the CWM sites on Main Post to address the potential presence of CWM or other subsurface disposal using geophysical surveys, excavation of suspect anomalies, continuous air monitoring, soil sampling, and laboratory analysis of the soils for chemical agent and chemical agent breakdown products. The CWM EE/CA investigation did not find any evidence of soil contamination by chemical agent. Based on the results of soil sampling and analysis, it could be inferred there are not any sources of CWM in the environment on the Main Post; therefore, the likelihood of current or future risk of human exposure to chemical agents is very small. Parsons concluded that current and future human health risks due to exposure to CWM at these sites are very small. Parsons recommended "no further action" for Parcels 180(7), 182(7), 511(7), 512(7), 513(7), 514(7), and 516(7). In addition, any warning signs for CWM previously posted at these sites as precautionary measures should be removed (Parsons, 2002).

As a result of the CWM investigation by Parsons, USACE-Huntsville Center issued a release of CWM sites on the main post to conduct HTRW investigations, a copy of which is attached to the site-specific safety and health plan contained in this binder.

All of the Training Area T-5 Sites were investigated by SAIC prior to IT's 2001-2002 SI. The scope of the SI conducted by IT was outlined in *Chemical Warfare Material Sites – Agent ID Area (Parcel 509), Training Area T-6 (Naylor Field) (Parcel 183), Blacktop Training Area (Parcel 511), Fenced Yard in Blacktop Area (Parcel 512), Dog Training Area (Parcel 513), Dog Kennel Area (Parcel 516), Training Area T-5 (Parcel 182), Former Detection and Identification Area (Parcel 180), Old Burn Pit (Parcel 514), CBR Proficiency Area (Parcel 517), and Old Toxic Training Area (Parcel 188), Fort McClellan, Calhoun County, Alabama* (IT, 2000). The results of the investigations are presented in Chapter 2.0 of the site-specific field sampling plan contained in this binder.

The U.S. Army Corps of Engineers-Huntsville requires that work conducted at potential CWM sites use UXO anomaly avoidance techniques. Therefore, prior to initiating field activities at Training Area T-5 Sites, Parcels 180(7), 182(7), 511(7), 512(7), 513(7), 514(7), and 516(7), IT will conduct UXO avoidance activities as outlined in Appendix E of the installation-wide sampling and analysis plan (SAP) (IT, 2002) and the attached site-specific UXO safety plan. Surface sweeps and downhole surveys will be conducted to identify anomalies for the purpose of UXO avoidance.

2.0 UXO Team Composition

UXO team and personnel requirements will be in accordance with EP 75-1-2 (USACE, 2000) and the SAP for FTMC (IT, 2002). A UXO team will be on site during all sampling or intrusive activities where OE is suspected.

3.0 Responsibilities

The UXO team leader is responsible for ensuring that personnel performing UXO tasks at FTMC have the required qualifications. The UXO team leader supervises and coordinates UXO work activities.

The UXO team member(s) will provide UXO avoidance, explosive ordnance recognition, location, and safety functions for IT employees and any subcontractors during sampling activities. Additionally, the UXO team will survey sample points and safe access and egress to and from the site in support of HTRW operations.

4.0 Authority

UXO personnel are authorized to perform UXO avoidance activities only. UXO personnel are not permitted to initiate OE investigative or disposal activities.

5.0 UXO Avoidance Procedures to Support HTRW Sampling Activities at FTMC

The scope of work for site investigation activities at the Training Area T-5 Sites, Parcels 180(7), 182(7), 511(7), 512(7), 513(7), 514(7), and 516(7), includes the following UXO tasks:

- Provide UXO avoidance support during the collection of 48 groundwater samples (22 proposed monitoring wells and 26 pre-existing monitoring wells), 11 surface soil samples, 11 subsurface soil samples, 10 depositional soil samples, 1 surface water sample, and 1 sediment sample at this site. Sample locations are defined in Section 4.0 of the site-specific field sampling plan contained in this binder.

- Provide downhole UXO support for all intrusive drilling to determine buried downhole hazards.

- Provide surveys for all intrusive field activities (e.g., digging, fence post driving, grading, or excavation).

- Since these areas may contain OE contamination, the UXO team must conduct a surface access survey for UXO before any type of activities commence. This includes foot and vehicular traffic. UXO avoidance activities at Training Area T-5 Sites will include:

  a) Access Corridors and Sampling Sites

     (1) An access survey is defined as a UXO sweep performed to allow entry to and exit from sampling sites. In cases where hand auger sampling is required, the UXO team may consist of a UXO technician and sampling personnel. The UXO technician will sweep ahead of the non-UXO technician team member and mark a clear route. Access surveys will begin in a known clear area and proceed by the most direct route to the sampling site. The boundaries of the access route, whether for vehicle or personnel traffic, and the area of the sampling site, will be marked with white tape or white pin flags.

     (2) If an OE item is found during the survey, the location will be conspicuously marked with a red pin flag and avoided by altering the route. Subsurface anomalies will be marked with a yellow flag and avoided by altering the route. Additionally, UXO personnel will complete the IT FTMC "Unexploded Ordnance Report Form."

     (3) The boundaries of the access route and sampling site will be recorded in the IT FTMC "UXO Sketch Log" by the UXO technician. Additionally, anomaly locations will be recorded on this form.

     (4) Instrumentation used at this site will include the Schonstedt GA 72, the CST Corporation Magna-Trak 102, or the Whites Spectrum XLT Metal Detector. Additionally, the Schonstedt MG-220 or MG-230 will be set up for downhole monitoring. All equipment will be operated as specified in the appropriate operator's manual. All equipment will be function tested prior to use following the procedure in paragraph 3.2, *FTMC UXO Supplementary Procedures* (IT, 2001) and the operator's instructions. The Whites Metal Detector will be used in conjunction with hand-held magnetometers in areas of high concentrations of rocks with a magnetic signature to assist in eliminating anomalies created by "hot rocks."

     (5) The access route will be twice as wide as the widest vehicle that will use the route. Footpath lanes will be a minimum of three feet wide.

(6) If surface OE or subsurface anomalies are encountered that cannot be avoided, the access route must be diverted to avoid contact. No personnel will be allowed outside of the surveyed areas without a UXO escort. No unescorted access is permitted inside the corridor area until a survey has been completed and boundaries established.

(7) At the actual investigation site, the UXO team must also complete a survey of an area sufficient to support mechanical excavation equipment maneuverability, parking of support vehicles, and establishment of decontamination stations. At a minimum, the surveyed area should have a dimension in all directions equal to twice the length of the largest vehicle or piece of equipment to be brought on site. White pin flags or tape will be used to mark the boundaries of the surveyed site.

(8) Surface soil samples are normally collected at depths of 0 to 12 inches below ground surface. The UXO team will survey the area of the soil sampling site for any indication of OE. Sampling is not permitted at any location where an anomaly has been detected.

(9) Tracked or other vehicles whose movement would disturb the soil are authorized for use only in areas that have been surveyed and in which no anomalies have been detected.

(10) If grading or soil movement is required to support access corridor development or a sampling location, UXO personnel will perform a survey. After an area has been surveyed and no anomalies have been detected, soil can be removed at a rate of no more than one foot per cut. If additional grading is required, another survey will be performed after each one foot of soil has been removed.

(11) Erosion and weathering will typically cause some OE items to leach to the surface or otherwise be uncovered. In cases where access corridors or sampling sites have not been surveyed or traversed for a period of time, additional surveys may be required. The decision regarding the performance of follow-on surveys will be made by the site superintendent with input provided by the FTMC UXO safety officer and FTMC UXO team leader. The decision will be based on such factors as: the amount of time since the last survey was performed, the weather during this period, the terrain in the area of concern, the former use of the area, and the type and quantity of OE found during initial surveys.

(12) Incremental geophysical surveys at drill hole locations will be initially accomplished using a hand auger to install a pilot hole. An access survey of the immediate vicinity of the pilot hole location will precede

the installation of the pilot hole. The UXO team will use a manual or mechanical portable auger to install the pilot hole. The augered hole will be inspected for anomalies with a geophysical instrument (configured for downhole utilization) in two-foot increments as the hole is advanced below ground surface. Hand augering of a hole will not proceed if an anomaly is detected that cannot be positively identified as inert material. If a suspect OE item is encountered, the sampling personnel must select a new drill hole location. The pilot hole will also be inspected with the geophysical instrument upon reaching the final depth of the hand augered hole, providing a total clearance depth equal to pilot hole depth plus two feet. If the proposed site is still free of magnetic anomalies, the drilling equipment may be brought on site and utilized. The UXO team will continue to inspect the drill hole for anomalies at two-foot increments as the drilling is advanced from the clearance depth of the pilot hole until a depth of 12 feet is reached.

b) Vegetation Removal

In cases where removal of large trees or other vegetation is required to support access or sampling operations, the procedures in paragraph 4.2, *FTMC UXO Supplementary Procedures* (IT, 2001) will be followed.

c) Magnetometer/Metal Detector Checkout and Field Procedures

The procedures in paragraph 3.0, *FTMC UXO Supplementary Procedures* (IT, 2001) will be followed. Since previous OE/UXO uses of the Training Area T-5 Sites, Parcels 180(7), 182(7), 511(7), 512(7), 513(7), 514(7), and 516(7), are unknown, the function test will utilize the function test ordnance that most closely approximates the 75 mm projectile. The UXO team leader may designate another function test item if other types of ordnance are discovered.

d) UXO Logbooks and Documentation

All UXO personnel identified in paragraph 5.0, *FTMC UXO Supplementary Procedures* (IT, 2001) will maintain a logbook in accordance with that procedure.

6.0 Safety

In addition to the requirements of the site-specific safety and health plan prepared for this site, the UXO personnel will ensure the following:

a) During the access and subsurface surveys conducted with a geophysical instrument, the UXO team members will not wear safety shoes or other footwear that would cause the instrument to present a false response.

b) The UXO team will not be required to wear protective helmets unless an overhead hazard is present.

c) The FTMC UXO safety officer will monitor UXO activities to ensure compliance with applicable safety requirements.

d) The FTMC UXO safety officer will certify that all FTMC UXO workers are capable of performing UXO activities at FTMC based on observation of work performance.

e) The FTMC UXO safety officer is responsible for all site-specific UXO training.

f) The UXO technician on site will advise project personnel regarding all evacuation and/or exclusion zones as appropriate. The UXO technician will monitor all sampling site activities to ensure that only the minimum number of personnel are present on site.

7.0 Quality

The IT FTMC UXO quality control officer will follow quality control instructions and procedures listed in Section 9.0 of the installation-wide OE management plan contained in Volume IV of the SAP (IT, 2002) appropriate to this task and the *FTMC UXO Supplementary Procedures*. The IT FTMC UXO quality control officer will also utilize the "UXO Avoidance Quality Control Report" to document his activities. Copies of this form will be provided to the IT quality assurance representative upon request.

8.0 References

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ATTACHMENT 1

FORT MCCLELLAN UNEXPLODED ORDNANCE SUPPLEMENTARY PROCEDURES

FTMC UXO SUPPLEMENTARY PROCEDURES

Subject: Ordnance and Explosives

1.0 INTRODUCTION

IT Corporation (IT) has been retained by the U.S. Army Corps of Engineers-Mobile District, under Contract Number DACA21-96-D-0018, to provide environmental services related to Base realignment and closure (BRAC) of Fort McClellan, Alabama. The Installation-Wide Ordnance and Explosives (OE) Management Plan for Fort McClellan (FTMC) was prepared by IT Corporation and submitted as a final document in March 2000. The Installation-Wide OE Management Plan was prepared to provide general guidance for conducting unexploded ordnance (UXO) work associated with hazardous, toxic, and radiological waste (HTRW) investigations and remedial activities currently in progress at FTMC. IT Corporation prepares site-specific field sampling, health and safety, and UXO safety plans for sites where fieldwork will occur that may potentially contain OE. A UXO Safety Plan is not prepared for sites that are not reported to be in areas containing OE.

1.1 Purpose

This document is intended to provide procedures to the field staff that outline UXO operations and clarify activities currently permitted under "anomaly avoidance." The document is not intended to replace any of the project documents currently approved; rather, it is intended to complement those documents with additional information that allows successful completion of the job.

2.0 FTMC EMPLOYEE ORIENTATION/TRAINING AND CERTIFICATION

The IT FTMC orientation program is designed to:

- Indoctrinate new employees to FTMC-unique procedures
- Verify compliance with regulatory certification requirements
- Provide continuing instruction and updating in UXO fundamentals to sustain readiness to safely perform UXO tasks

2.1 Responsibilities

The IT OE Service Center Operations Manager will oversee the training programs and maintain a master record of UXO employee training and certification status.

The UXO person designated as the senior IT UXO individual at FTMC will schedule the orientation listed below.

The FTMC UXO Safety Officer will:

- Conduct all UXO-specific orientation and training at FTMC
- Certify that each new UXO employee is capable of performing UXO work activities at FTMC
- Maintain FTMC training files and records on each UXO technician on site reflecting his or her current training status.

2.2 UXO Employee Orientation

Every UXO employee assigned to FTMC will receive a site-specific UXO orientation in addition to training required by the Occupational Health and Safety Administration (OSHA). This orientation will include, as a minimum, the following topics:

- Local emergency response drills and procedures
- Personal protective equipment (PPE) and personnel decontamination procedures
- Ordnance recognition/UXO expected to be encountered at FTMC
- Equipment safety
- FTMC site orientation
- Chemical warfare material (CWM) awareness and procedures
- Communications procedures
- FTMC Logbook/data recording procedures
- IT administrative policies and procedures
- Magnetometer checkout procedures.

Upon completion of the UXO employee orientation, the FTMC UXO Safety Officer will monitor the performance of the new hire for at least three workdays while conducting typical UXO activities. The FTMC UXO Safety Officer will

then certify that the individual is capable of performing UXO activities at FTMC based upon satisfactory performance of the three-day period. A copy of this certification will be maintained in the individual's site FTMC training file (see example at Attachment 1).

2.3 UXO Sustainment Training

All UXO technicians have had the OSHA 40-hour hazardous waste operations and emergency response (HAZWOPER) course in order to be initially certified at FTMC. They are also required to maintain the certification with an 8-hour OSHA refresher course on an annual basis. Additionally, all IT FTMC UXO personnel will have 8 hours of site-specific annual UXO sustainment training. This training can be performed incrementally (2 hours every quarter) at the discretion of the site superintendent in coordination with the FTMC IT UXO Safety Officer. Topics will include, but are not limited to, the following subjects:

- Site-specific environmental hazards
- Site-specific UXO hazards, ordnance fuzing, functioning and precautions
- Topics which the IT UXO Team Leader or IT Safety UXO Officer determines necessary to support FTMC UXO activities

Sustainment training will be conducted for a period of no less than 8 hours. Daily safety briefings, tailgate safety meetings, and other required site-specific training are not a substitute for this training. The purpose of this training is to provide each UXO employee with site-specific UXO training over and above OSHA requirements. The site-specific UXO training will be recorded in the project file and the UXO employee's personnel file.

3.0 FTMC MAGNETOMETER/METAL DETECTOR FUNCTION TEST AND FIELD PROCEDURES

This section provides FTMC magnetometer/metal detector function tests and operating procedures to be employed at all work sites that have been identified as requiring avoidance support.

3.1 Geophysical Test Plot

The purpose of a test plot is to provide a consistent environment where the equipment can be evaluated. The location of the geophysical test plot will be inside the IT compound. It will be established as follows

- The test plot will consist of an area approximately 20 x 20 feet and clear of vegetation and magnetic anomalies, located in the IT compound next to the southeast end of the office trailers.

- Five metal test objects will be buried at depths varying from 6 inches to 24 inches. The objects will approximate the weight, diameter, and length of an MK 2 grenade, a 60mm mortar, a 2.36-inch rocket warhead, a 75mm projectile, and a 37mm projectile. Additionally, three non-ferrous test objects will be buried at a depth of 2 inches to 8 inches. A 6-inch length of 1/2-inch reinforcing rod will be placed on the surface for use as a surface check source. Items with greater mass will be buried at greater depths. Each burial location will be marked with a wooden stake located about 6 inches to the north of the object. Each stake will be assigned a reference number and will be tagged or marked to denote the depth, type of item and orientation of the item. The site will utilize native soils; no fill material will be brought in from another area. Sand will be used to cover the area to mitigate the effects of wet weather.

- For downhole magnetometer testing, a length of 2-inch PVC pipe will be buried to a depth of 36 inches. The pipe should be of sufficient length to allow at least another 24 inches to extend above the surface of the ground. A metal object will be buried at a depth of 24 inches and 24 inches from the side of the pipe. The location of the item, similar in size and mass to a 75mm projectile, will be marked with a wooden stake tagged to denote the depth, type of item, orientation, and reference number assigned.

3.2 Magnetometer/Metal Detector Check-Out Procedures

- Prior to field use, all magnetometers and metal detectors will be set up following the guidelines in the manufacturer's operating manual for the specific instrument used. Instrumentation used at this site will include the Schonstedt GA 72, the CST Corporation Magna-Trak 102, or White's Spectrum XLT Metal Detector. Additionally, the Schonstedt MG-220 or

MG-230 will be set up for downhole monitoring. All equipment will be operated in a manner consistent with instructions contained in the appropriate operator's manual. All equipment will be function-tested prior to use. The White's Metal Detector will be used in conjunction with hand-held magnetometers in areas of high concentrations of rocks with a magnetic signature, to assist in eliminating anomalies created by "hot rocks." The operating manual for each of the instruments used at FTMC will be available for use with the equipment.

- Once the instrument has been determined to be working according to the manufacturer's operating manual, the operator will perform a function test on the FTMC geophysical test plot using the detection methods described in the manual. A function test will consist of using the instrument over a minimum of three test sources. The same sources will be used during each function test to ensure consistency. The instrument detection indicator, as described in the operator's manual, will be noted in the instrument logbook. For site checks, a 6-inch length of 1/2-inch steel reinforcing rod will be available to each operator at the work site.

- Instruments that fail to reproduce a detection indication consistent with previous tests will be checked to ensure that the power supply or batteries are sufficient. If the power supply is determined to be sufficient and the operator cannot find a fault in accordance with the operator's manual, the instrument will be tagged and removed from service.

- Function tests will be performed each morning before the equipment is put into service.

- If an instrument is determined to be working improperly, the FTMC UXO Team Leader and the site superintendent will be immediately notified. Any activities performed using that instrument since its last positive test procedure will be considered invalid and will require reevaluation.

- Upon completion of the function test, the "Magnetometer/Metal Detector Functions Test Data Sheet" (Attachment 2) and the equipment logbook will be filled out.

- After an instrument has been function-tested at the beginning of each day, the instrument will be checked at least once during every hour of use or each time the instrument is turned on after having been turned off. This check will consist of dropping the 6-inch length of 1/2-inch reinforcing rod in a clear area and passing the detector over the rod in a manner consistent with the operator's instructions. The instrument indication will be compared to the indication produced during the morning function test. Instruments that fail to produce a consistent indication will be checked and removed from service as required.

3.3 Equipment Documentation

Each piece of equipment will be assigned a logbook noting the make, model, manufacturer, and serial number of the equipment. The logbook and manufacturer's operating manual will be present when the equipment is tested. The following information will be recorded:

- Date and time
- The test plot object used (assigned stake number)
- The reading or indication at each test site
- Whether or not the reading or indication was satisfactory
- The name of the individual performing the test.

The IT FTMC Quality Control (QC) Officer will observe the daily testing of all equipment and will record the results of each test in his field logbook.

3.4 Magnetometer/Metal Detector Field Procedures

All intrusive field actives in potential OE areas (e.g., digging, fence post driving, grading, well installation or excavation) will be preceded by a UXO sweep. Each hole made in areas where OE may potentially be found will have a check immediately over the spot of the intrusion. Magnetometer operations at FTMC will assume a detection depth of one foot when surveying an area for excavation.

All magnetometers and metal detectors will be operated in accordance with the manufacturers specifications and procedures.

When surveying a potential area for a sampling well, an area of sufficient size will be surveyed to allow for installation of required pads and bollards. After the well

is installed, the location of bollards will be adjusted as required if an anomaly is detected during the bollard installation process.

The White's Metal Detector will be used to augment the magnetometers on sites where "hot rocks" are suspected. The purpose of using the metal detector in addition to the magnetometers is to eliminate the probability of "hot rocks."

4.0 FTMC ACCESS CLEARANCES, VEGETATION REMOVAL, AND ROAD MAINTENANCE

This section is designed to provide specific procedures regarding activities associated with the building of access corridors, vegetation removal, and road maintenance in support of FTMC operations.

4.1 Access Corridors

The purpose of access corridors is to enable IT personnel access to well and/or other types of sampling sites within FTMC. Access corridors will be created by marking the route, both length and width, in which a UXO survey has been performed. The marking method will be defined in each site-specific UXO safety plan. No unescorted access is permitted until a corridor has been established. If an anomaly is detected during the survey or during a subsequent excavation, it must be avoided, since investigation is not authorized. The route will be altered to avoid the anomaly for FTMC activities. A magnetometer is considered to reliably detect anomalies to a depth of one foot.

The size of each area to be surveyed is dependent on the type and quantity of equipment expected to be used on that site. The UXO survey crew will follow the procedures outlined in the site-specific UXO safety plan to determine the dimensions of the area to be surveyed. Normally, the width of the access route will be at least twice as wide as the widest vehicle that will use the route; footpaths will be a minimum of 3 feet wide.

Tracked or other vehicles, that disturb the soil are authorized for use only in areas that have been surveyed and no anomalies have been detected.

Erosion and weathering will typically cause some UXO items to leach to the surface or otherwise be uncovered. In cases where access corridors or sampling sites have not been surveyed or traversed for a period of time, additional UXO surveys may be required. The decision regarding the performance of additional

surveys will be made by the FTMC UXO team leader and the IT FTMC UXO Safety Officer. The site superintendent will be notified of this decision. This decision will be based on, but not limited to, such factors as: the amount of time since the last survey was performed; the weather during this period; the terrain in the area of concern; and the type and quantity of UXO found during initial surveys.

4.2 Vegetation Removal

In cases where removal of large trees or other types of vegetation is required, the following procedures will be followed:

- The UXO technician will survey around the base of the tree or vegetation, and, if no anomaly is detected, direct the bulldozer or other equipment to proceed. If an anomaly is detected, the location will be recorded and marked and another route will be selected. The size of the area to be surveyed will depend on the size of the suspected root system of the tree to be removed.

- Once the tree has been pushed over, the UXO technician will survey around the root ball and the area in and around the hole. If an anomaly is detected, the anomaly will be recorded and marked and an alternate route will be selected. If no anomaly is detected, the UXO technician will direct the equipment operator to proceed with the excavation.

4.3 Road Maintenance

Remote range roads and trails frequently require a certain amount of repair to remain passable. This section describes authorized actions regarding the maintenance of dirt or gravel range roads by IT UXO personnel.

- Bulldozers or grader-type equipment is authorized to repair roads and trails as long as a UXO survey has been performed and no anomalies have been detected.

- The UXO technician will observe the blade of the equipment as the earth is moved. If a potential UXO is uncovered, the UXO technician will signal the equipment operator to immediately stop the equipment. The UXO technician will then attempt to visually identify the object. If the object cannot be positively identified as a non-hazardous item, the

equipment will be moved, the location of the object marked and recorded on the IT FTMC Unexploded Ordnance Report Form (Attachment 3), and the route changed to avoid the object. If no suspicious objects are detected, the equipment will continue to move earth at a rate of no more than one foot of depth at a time. If, more grading is required after the first past is complete the UXO technician will perform another survey. If no anomalies are detected, the equipment can repeat the grading process. If an anomaly is detected, the operation will be halted and the route changed.

- After an area has been surveyed and no anomalies have been detected, soil can be removed at a rate of no more than one foot per lift. If additional grading is required, a survey will be performed after each one-foot increment the soil has been removed.

- Earth may not, at any time, be moved at a rate of more than one foot in each lift.

5.0 FTMC UXO LOG BOOKS

All UXO team leaders or UXO technicians supporting HTRW operations will maintain a logbook. The purpose of the logbook is to record UXO actions and activities taken at each work site.

5.1 Responsibilities

UXO personnel will maintain an individual daily logbook of work activities.

The logbooks will be routinely inspected weekly by the UXO QC Officer and will be made available to the FTMC site superintendent upon request. Copies will be made daily and filed in the IT Field Project office.

Logbooks will contain bound and numbered pages. Entries will be on successive pages as work is performed. The individual using the logbook will sign the page after the last entry for that page has been made. Logbooks are part of the project legal file and will be filed with the project files upon completion of each investigation.

5.2 Data Requirements

As a minimum, individual logbooks will contain the following information:

- Date, time and location of UXO activities
- Personnel involved in the activities
- UXO activities performed, including UXO/anomalies found
- A description of areas swept
- A record of the magnetometer or other equipment used, including instrument serial number
- Weather conditions.

The IT FTMC QC Officer will utilize the IT FTMC "UXO Avoidance Quality Control Report" (Attachment 4) to document checks of field activities.

Additionally, UXO personnel will complete IT FTMC Form "UXO Sketch Log" (Attachment 5) and IT FTMC Unexploded Ordnance Report Form. The "UXO Sketch Log" will contain a description of activities, including the dimensions of the area surveyed. A description of the length and width will be recorded, as well as the manner in which the survey was performed. These forms will be completed as required and presented to the site superintendent.

ATTACHMENT 1

FTMC Employee Certification
(Example)

I certify that (name of individual) has fulfilled all UXO orientation requirements and has been observed by me for a period of 3 work days and is therefore eligible to perform UXO activities at FTMC.

_____

Talmadge Bohannon
FTMC UXO Safety Officer

ATTACHMENT 2

Magnetometer/Metal Detector Functions Test Data Sheet

Each magnetometer and/or metal detector will receive a function test at the beginning of each workday and after changing batteries. The function test will include operating the magnetometer/metal detector over a test area developed specifically for ensuring that detection instruments are operating properly. Instruments that do not pass the function test will be tagged out until repairs are made or a replacement instrument is available.

Project Number: _____

Instrument Model: _____

Instrument Serial Number: _____

Date	Person Performing Test	Function Test Results	Remarks

ATTACHMENT 3

Unexploded Ordnance Report Form

Report Tracking Number:

Discovery and Reporting Time

Time of Discovery	
Date	Time

Time Reported to Base Transition Force	
Date	Time

Employee Name:_____

Reported to FTMC Transitional Force Personnel

Name:_____

Location of Ordnance

Location, Description, and Parcel Number:

Coordinates of Ordnance:	State Plane Coordinates	
	Northing	Easting

Picture Taken of Ordnance			
Yes	No	Date	Time

Written Description and/or Sketch of Ordnance:

Corrective Action Taken by Fort McClellan Transition Force

Date	

ATTACHMENT 4

UXO Quality Control Report

Project Location: _____ **Date:** _____

Work Site Location: _____ **Day:** _____

1. **Personnel Involved:**

_____
_____
_____
_____
_____

2. **Description of Work Being Performed:**

_____
_____
_____
_____
_____

3. **Equipment Utilized:**

_____
_____
_____
_____
_____

4. **Comments:**

_____
_____
_____
_____
_____

_____ _____
Completed By **Printed Name & Title**

_____ _____
Signature **Date**

ATTACHMENT 5

UXO Sketch Location Log

District:_____ **Hole Number:**_____ **Date:**_____

Company Name: IT Corporation **Subcontractor:**_____

Parcel Location:_____ Well Location:_____ Date Started:_____ Date Completed:_____

Type of UXO Work Being Performed:

Most Probable Munition:	
Down-Hole Depth Achieved for UXO Avoidance:	
Total Number of Surface UXO Marked:	
Total Number of Anomalies Marked:	

Location Sketch/Comments:	**Not to Scale**
Signature of UXO Technician:	Date: